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CASE REPORT

VASCULAR COMPLICATION AFTER LATERAL TEMPORAL LIFTING TECHNIQUE: A CASE REPORT

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Abstract

Vascular complication after lateral temporal lifting technique with hyaluronic acid-based fillers may result from arterial occlusion by direct injection into the artery or embolization with the product, which is usually immediately manifested by acute pain and scarlet-red spots due to hemorrhagic blisters. Vascular complication can also result from venous occlusion caused by external compression of the vessel with soft tissue filler.

Vascular occlusion requires immediate treatment as the risk of tissue damage and skin necrosis increases with time.

In this paper we consider a clinical case of vascular complication after the technique of lateral temporal lifting of hyaluronic acid, manifested by painfulness of the area of hyaluronic acid injection, Livedo reticularis, alopecia, and treatment of this patient for 3 months.

Keywords: *filler, hyaluronic acid, temporal fossa, volume deficit, cosmetic procedure, vascular complication*

Introduction

Age-related facial changes include thinning of the epidermis, loss of skin elasticity, muscle atrophy, subcutaneous adipose and bone changes resulting in volume loss. As the temporal bones become more concave, temporal muscle atrophies, and temporal adipose tissue volume decreases, the loss of volume results in an undesirable haggard appearance.[1,2,3] By reshaping the temporal fossa and upper face with

hyaluronic acid-based filler, cosmetic physicians can achieve a balanced and more youthful facial structure.

The joining of the scaly portion of the temporal bone, parietal bone, the greater wing of sphenoid bone, and the frontal bone at a point known as the pterion creates the osseous structure of the temporal region. The temporal fossa directly covers the scaly part of the temporal bone and is bordered below by the zygomatic arch of the temporal bone. Above these bones lie the periosteum, temporal muscle, and temporal fascia. Several important vessels are located in the periphery of the temporal region, including the zygomatico-orbital (medial), middle temporal and superficial temporal arteries (both lateral), all terminal branches of the external carotid artery, and the zygomaticofacial artery (medial), which branches distal to the internal carotid artery.[4] These arteries are of particular concern to cosmetic physicians because injections into them can lead to vascular complications, particularly filler embolism.[5]

Complications of filler injection into the temporal fossa include bruising, soreness, edema, hypercorrection, and discomfort with chewing, forming a headache trigger.[6,7] Serious complications include infection, foreign body granuloma, intravascular necrosis, and ocular artery embolization.[8,9,10,11] Clinicians should be aware of possible complications and promptly provide treatment.

Clinical case

Vascular complication after lateral temporal elevator technique.

We performed a study of the temporal region on cadavers (Institute of Anatomy, Skolkovo) in the context of the obtained complication. By layer-by-layer dissection of 25 anatomical certified objects of human heads (average age 43±0.5 years) with the preliminary introduction of red low-modulus silicone, options for the location of the superficial temporal artery and division into the anterior auricular branches were determined. For this purpose, a stained silicone paste was injected into the external carotid artery to visualize the vascular bed. Further the temporal region was opened and potential anastomoses with the posterior auricular artery were identified, as well as the microvasculature in the subcutaneous layer, which, when compressed, is involved in the formation of the livedo reticularis.

On March 8, 2023 at 12:00 p.m., the patient underwent correction of the lateral temporal area with hyaluronic acid-based filler in the B. UP technique (0.5 ml on both sides) and filling of the temporal area with the interfascial technique (0.5 ml on both sides). The instrument used was a 22G/50 MM cannula. Protocol for correction of the lateral temporal zone: the point for cannula entry - 1-1.5 cm in front of the antilobium, skin puncture and advancement of the cannula 1.5 cm beyond the hair growth line, injection of filler in several boluses next to each other (total volume of 0.5 ml on one side). The level of injection was subcutaneous adipose tissue (Figure 1 A)

Half an hour later, patient returned with a complaint of point pain "on the top of the head" (on the border between the parietal and frontal areas) and skin discoloration of the temporal area.

Half an hour after admission, the patient returns with a complaint of acute pain "on the top of the head" (on the border between the parietal and frontal areas) and a change in skin color of the temporal area. Objectively: Livedo reticularis (vascular spots of reddish-blue color, forming a reticular pattern); painful spot on the parietal area. The skin color of the scalp of the temporal area was not changed (Figure 1 B).

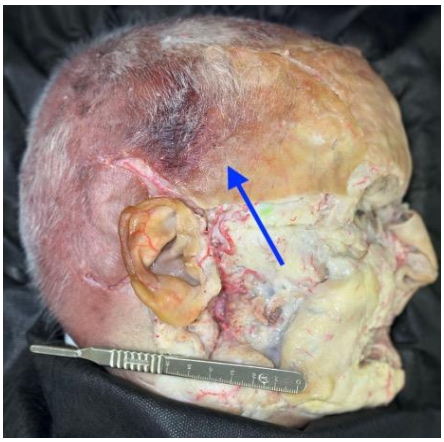

Figure 1 A. *Planned temporal zone correction*

Figure 1 B. *Livedo reticularis on the patient half an hour after the end of the procedure*

Treatment of complication: March 8 at 12:45 p.m. bovhyaluronidase azoximer 3000 IU (3 ml saline solution + 0.5 ml dexamethasone) three times every hour. Injections on the entire area of the color-changed skin and on the skin of the scalp of the temporal area on the affected side with transition to the parietal area to the painful point in 1 cm intervals. Local cooling. Sildenafil a single dose. Pentoxifylline in tablets immediately and for 5 days, acetylsalicylic acid 100 mg. Local application of heparin sodium ointment (Figure 2 A).

The patient flew the same evening to the other side of the country. All treatment was administered remotely, the treatment was performed by a physician in another city.

March 9 in the morning complaints of skin numbness of the temporal scalp, soreness from hematomas (Figure 2 B).

Figure (2 A) - Complication treatment on the day of the procedure; (2 B) - Complaints of numbness of the skin of the scalp of the temporal area, soreness from hematomas on the next day after the procedure.

Figure 2 A. *Complication treatment on the day of the procedure*

Figure 2 B. *Complaints of numbness of the skin of the scalp of the temporal area, soreness from hematomas on the next day after the procedure*

Treatment

Continuation of bovhyaluronidase azoximer - 3000 IU, pentoxifylline by drop introvenous infusion for 4 days, ciprofloxacin + tinidazole 500/600 mg - 1 tablet 2 times a day, eubiotics - 2 capsules 3 times a day. (Figure 3 A, B).

Figure 3 A. *The 4th day of the vascular complication treatment*

Figure 3 B. *The 6th day of the vascular complication treatment*

From March 15, hyperbaric chamber every day for 7-10 days; ibuprofen 200 mg 3 times a day.

The results of treatment are presented in the figures (Figure 4 A, B, C).

Figure 4 A. *The 10th day of the vascular complication treatment*

Figure 4 B. *The 12th day of the vascular complication treatment*

Figure 4 C. *36 days after the procedure*

From May 15, Minoxidil 5% 1 -2 times a day, 1 month

By the end of June, the patient stopped external treatment as hair growth was fully restored (Figure 5).

Figure *5. After 3 months of treatment, hair growth has been restored*

Discussion

The patient was diagnosed with embolization of the superficial temporal artery with migration to the temporal branch of the superficial temporal artery, post-ischemic alopecia. The filler was injected not into the subcutaneous adipose tissue but into the vascular network of the superficial temporal artery (Figure 6). It was found that in individuals with a low body mass index, as well as with brachycrania, multiple perforating arteries are observed, connecting to the collateral branches of the posterior auricular artery.

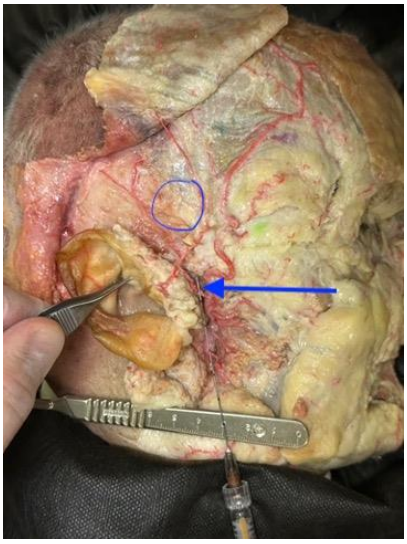

Figure 6. *Location of the superficial temporal artery branch*

The subcutaneous temporal region is an easily accessible plane for temporal volume augmentation.

The layers of the temporal fossa include the skin, subcutaneous adipose tissue, superficial temporal fascia, deep temporal fascia, temporal muscle, pericranium, and temporal bone. Age-related changes, including thinning of subcutaneous adipose tissue and the temporal muscle, affect each of these structures to form temporal hollowing.

Several authors have reported excellent results after injection into the subcutaneous and deep subcutaneous planes, as well as the plane immediately beneath the superficial temporal fascia,[12] but complications have also been reported. The injection planes correspond to the cutaneous and superficial arterial network of the temporal fascia. Putative pathologies of the superficial temporal artery that have been reported after cosmetic injections in this area include branch retinal artery occlusion, pseudoaneurysm, and alopecia.[13,14,15,16,17] Anastomoses between the superficial facial, deep facial, and deep muscular arterial networks in this region can cause retrograde intraarterial flow of hyaluronic acid gel in the superficial temporal artery.[12]

Another mechanism of local ischemic complications may involve vasoconstriction. The gel may fuse in the perivascular fibrous septa of subcutaneous or fascial tissues, constricting the vessel.[18]

Juhász and Marmur (2015)[6] noted that intravascular necrosis after filler injection occurs due to accidental intraarterial injection causing drug-induced skin embolism. If dermal angiosomes are disrupted, full-thickness necrosis may occur. Risk factors for intravascular necrosis include injection of a large amount of filler at a single site, deep injection, and use of a sharp needle. The authors note that intravascular necrosis can manifest in a variety of ways. Intense pain immediately after injection may be disguised by the effects of lidocaine. However, signs of pallor, a reticulated skin pattern, or scarlet-red patches due to hemorrhagic blisters (which may persist for up to 72 hours) may appear shortly after injection. Necrosis occurs between 2 and 7 days after injection. It is important to recognize intravascular necrosis as early as possible and, if possible, inject hyaluronidase, an enzyme used in cosmetology to eliminate unpleasant complications after injections with hyaluronic acid medications.

Conclusions

Vascular occlusion has been identified as the most serious and dangerous early complication of aesthetic treatment, and its incidence appears to be increasing. Unintentional injection of hyaluronic acid-based filler into the arterial circulation occurs, which, unrecognized, is irreparably associated with vascular complications. It is worth noting that the localization of complications, regardless of injection site, is the same and accounts for only five areas of the face, all within the functional angiosome of the facial or ocular artery. Cosmetic physicians should be aware of the possible complications associated with filler injection into this sensitive area and promptly administer treatment.

Declarations

Conflict of interest and financial disclosure

The author declares that he has no conflict of interest and there was no external source of funding for the present study. None of the authors have any relevant financial relationship(s) with a commercial interest.

Ethical approval

Research protocol was approved by the local Ethical Committee (2018/23) and in accordance with those of the World Medical Association and the Helsinki Declaration.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Source of Funding

Non funding.

Availability of Data and Materials

Not applicable.

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ԱՆՈԹԱՅԻՆ ԲԱՐԴՈՒԹՅՈՒՆ ԿՈՂԱՅԻՆ ՔՈՒՆՔԱՅԻՆ ԲԱՐՁՐԱՑՄԱՆ ՏԵԽՆԻԿԱՅԻՑ ՀԵՏՈ. ԿԼԻՆԻԿԱԿԱՆ ԴԵՊՔ

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[2] Պլաստիկ վիրաբուժության և կոսմետոլոգիայի «Գեղեցկության ժամանակ» կլինիկա, Մոսկվա, Ռուսաստան

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Ամփոփում

Անոթային բարդությունը հիալուրոնաթթվով լցոնիչներով կողային քունքային բարձրացման տեխնիկայից հետո կարող է առաջանալ ուղղակի ներարկումով զարկերակ՝ զարկերակային խցանման հետևանքով կամ էմբոլիզացիայից, որը սովորաբար դրսևորվում է անմիջապես սուր ցավով և մանուշակագույն-կարմիր բծերով՝ հեմոռագիկ բշտիկների պատճառով: Անոթային բարդություն կարող է առաջանալ նաև երակային խցանման հետևանքով, որը պայմանավորված է փափուկ հյուսվածքների լցոնիչով անոթի արտաքին սեղմմամբ:

Անոթային խցանումը պահանջում է անհապաղ բուժում, քանի որ ժամանակի ընթացքում մեծանում է հյուսվածքների վնասման և մաշկի նեկրոզի վտանգը:

Աշխատանքը ուսումնասիրում է անոթային բարդության կլինիկական դեպքը՝ հիալուրոնաթթվով կողային քունքային բարձրացման տեխնիկայից հետո, որը դրսևորվում է որպես ցավ հիալուրոնաթթվի դեղամիջոցի ներարկման, լիդոյի, հետագայում ալոպեկիայի և պահանջվում է հիվանդի բուժումը 3 ամսվա ընթացքում:

СОСУДИСТОЕ ОСЛОЖНЕНИЕ ПОСЛЕ ТЕХНИКИ ЛАТЕРАЛЬНОГО ВИСОЧНОГО ЛИФТИНГА: КЛИНИЧЕСКОЙ СЛУЧАЙ

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Аннотация

Сосудистое осложнение после техники латерального височного лифтинга филлерами на основе гиалуроновой кислоты может возникнуть в результате тромба артерий путем прямой инъекции в артерию или эмболизации продуктом, что обычно сразу проявляется острой болью и багрово-красными пятнами из-за геморрагических пузырей. Сосудистое осложнение также может быть результатом венозного тромба из-за внешней компрессии сосуда наполнителем мягких тканей.

Сосудистий тромб требует немедленного лечения, так как со временем возрастает риск повреждения тканей и некроза кожи.

В работе рассмотрен клинический случай сосудистого осложнения после техники латерального височного лифтинга гиалуроновой кислоты, проявившийся болезненностью зоны введения препарата гиалуроновой кислоты, ливедо, в дальнейшем аллопецией, и лечение данной пациентки в течение 3-х месяцев.